IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re the Application

Inventor	**:**	**KOLLMANN**
Application No.	**:**	**10/537,855**
Filed	**:**	**11/08/2005**
For	**:**	**OSCILLATOR CIRCUIT FOR GENERATING A HIGH-FREQUENCY ELECTROMAGNETIC OSCILLATION**

APPEAL BRIEF

On Appeal from Group Art Unit 2817

Date: 9/8/2008

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Michael Ure
(Name)

(Signature and Date)

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I. REAL PARTY IN INTEREST

The real party in interest is NXP B.V., the successor in interest to the present assignee of record of the present application, Koninklijke Philips Electronics N.V., and not the party named in the above caption.

II. RELATED APPEALS AND INTERFERENCES

With regard to identifying by number and filing date all other appeals or interferences known to Appellant which will directly effect or be directly affected by or have a bearing on the Board's decision in this appeal, Appellant is not aware of any such appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-11 and 13-21 are pending of which 1-5, 7-9, 11, 13, 14 and 19 stand finally rejected and form the subject matter of the present appeal. Claims 6, 10, 15-18, 20 and 21 are objected to.

IV. STATUS OF AMENDMENTS

All amendments have been entered. No amendment after final rejection has been submitted.

V. SUMMARY of the CLAIMED SUBJECT MATTER

The present invention relates to an oscillator circuit. The oscillator circuit is realized in the form of a differential circuit including a crystal oscillator, a bandpass

filter, and an amplifier. As illustrated in Figure 3, terminals of the crystal oscillator are coupled to output signals of the amplifier and to input signals of the bandpass filter, with output signals of the bandpass filter being coupled back to the input signals of the amplifier. A low-jitter oscillator circuit is thereby achieved.

The following analysis of independent claim 1 is presented for convenience:

Element	Figure(s)	Paragraph(s) and/or page(s)
1. A differential oscillator circuit for generating a high-frequency electromagnetic oscillation, comprising:		
an amplifier configuration with two inputs and two outputs,	Fig. 3, 11	Page 12, lines 5-21
an oscillator crystal connected to the outputs of the amplifier configuration,	Fig. 3, 1	Page 12, lines 5-21
a bandpass filter configuration with two inputs and two outputs, which is connected, with two inputs, to the oscillator crystal and the two outputs of the amplifier configuration connected to the oscillator crystal, and back coupled, with two outputs, to the inputs of the amplifier configuration,	Fig. 3, 18	Page 12, lines 5-21
wherein, through dimensioning of the amplitude-frequency characteristic or the phase-frequency characteristic of the bandpass filter configuration as a function of the amplitude-frequency characteristic and the phase-frequency characteristic of		Page 12, line 22 to page 13, line 7

the amplifier configuration and the oscillator crystal, the oscillation condition is fulfilled exclusively for a selected harmonic of the oscillator crystal, and the high-frequency, electromagnetic oscillation formed by this selected harmonic of the oscillator crystal is available at the output of the bandpass filter configuration.		

VI. GROUNDS of REJECTION to be REVIEWED ON APPEAL

The issues in the present matter are whether:

1. under 35 USC 103, claims 1-3, 7, 8, 11, 13 and 19 are unpatentable over Wordelman in view of Ward.
2. under 35 USC 103, claims 4, 5 and 9 are unpatentable over Wordelman in view of Ward further in view of Balan.
3. under 35 USC 103, claim 14 is unpatentable over Wordelman in view of Ward further in view of Burgoon.

VII. ARGUMENT

I. Rejection of Claims 1-3, 7, 8, 11, 13 and 19 as Being Unpatentable Over Wordelman In View Of Ward

Wordelman teaches an actively-isolated trap for use in a conventional oscillator topology similar to that of the prior art described in relation to Figure 1 of the present specification. Because the trap is actively-isolated, aging effects due to aging of the trap components are minimized. As is characteristic of oscillators in general, the circuit of Wordelman defines a loop which may be seen to include an amplifier 12, the trap 16, and a resonator 18, which includes a crystal oscillator. In the rejection, the trap 16 is equated to the bandpass filter of claim 1.

The rejection takes the position that, although the oscillator circuit of Wordelman is single-ended, not differential as claimed, and because differential oscillator circuits are known (as exemplified by Ward), it would have been obvious to reconstitute the oscillator circuit of Wordelman in differential form. This seemingly simple conclusion is in fact a simplistic one, not supported by the references or by the level of ordinary skill in the art.

Oscillator circuits are typically classified into a small number of well-known types. One well-known type is the Colpitts oscillator. The Wordelman oscillator circuit is a variation of this well-known type. The Colpitts oscillator is traditionally a single-ended circuit. Other common types of oscillators include the Piece oscillator and the Clapp oscillator.

To reconstitute the oscillator circuit of Wordelman as a differential circuit would essentially destroy the reference and require the design of a new oscillator circuit,

essentially from scratch. One of ordinary skill in the art would not have been led to do so. Rather, if one of ordinary skill in the art felt compelled (for reasons of noise performance, for example) to use a differential oscillator circuit, he or she would turn to known examples of differential oscillators circuits (such as that of Ward). One of ordinary skill in the art would not attempt to reconstitute the oscillator circuit of Wordelman as a differential oscillator circuit, as the result of such an attempt would be entirely uncertain and would depart from established norms. For example, how a suppression trap like the suppression trap 16 of Wordelman would be realized in a differential oscillator circuit is entirely a matter of speculation.

Nor would it have been "obvious to try" such a wholesale reconstitution of the Wordelman oscillator circuit. Known differential oscillator circuits such as that of Ward do not require an inductor like the inductor La of Wordelman and hence do not encounter the problem addressed by Wordelman of aging effects as a consequence of inductor aging (Wordelman, col. 1, line 55).

Hence, what may appear obvious to a patent examiner looking to reject claim 1 would on the contrary not have been obvious to one of ordinary skill in the art.

Claim 7 relates to an offset compensation device (Fig. 8, element 52) comprising a high pass circuit (60/61; 62/63) between each of the differential inputs of the amplifier configuration, the gate terminals of the field effect transistors, and the drain terminals of the field effect transistors (forming the differential output). The high pass circuits 1232 and 1234 are not connected as claimed, since the oscillator driver circuit of Ward does not have any differential inputs. Claim 8 further specifies details of the offset compensation device of Claim 7.

With regard to dependent claims 2, 3, 11, 13 and 19, these claims depend from independent claim 1, which has been shown to be patently distinguishable over the cited reference. Accordingly, these claims are also patently distinguishable and allowable over the cited references by virtue of their dependency upon an allowable base claim.

II. Rejection of Claims 4, 5 and 9 as Being Unpatentable Over Wordelman In View Of Ward Further in View of Balan

Claim 4 relates to a control voltage generation stage (Fig. 8, element 50). A control voltage is generated and applied to gate terminals of the output load transistors (46 and 47). The control voltage 20 of Balan, on the other hand, is shown in Fig. 4 thereof as being applied to the gate of a PMOS transistor 42 that serves as a current source (col. 5, lines 23-26). That is, the control voltage is not applied to gate terminals of output load transistors as claimed. Claim 5 further specifies details of the control voltage generation stage of Claim 4.

Claim 9 relates to an auxiliary starting circuit (Fig. 9, element 65). By means of the auxiliary starting circuit, during a predetermined period when the oscillator circuit is put into operation, a differential voltage is supplied to the gate terminals of the field effect transistors (38, 39) of the amplifier configuration. There is no teaching of any such predetermined period in Balan.

III. Rejection of Claims Claim 14 as Being Unpatentable Over Wordelman In View Of Ward Further in View of Burgoon

Claim 14 recites that the bandpass filter configuration is designed with a cascade connection of at least two bandpass stages. Burgoon shows “a two-arm bandpass suppression approach” using circuits 14 and 16. They are not, however, connected is cascade.

In view of the above, applicant submits that all of the above referred-to claims are patentable over the teachings of the cited references.

VIII. CONCLUSION

In view of the above analysis, it is respectfully submitted that the referenced teachings, whether taken individually or in combination, fail to anticipate or render obvious the subject matter of any of the present claims. Therefore, reversal of all outstanding grounds of rejection is respectfully solicited.

Date: 9/8/2008

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IX. APPENDIX: THE CLAIMS ON APPEAL

1. A differential oscillator circuit for generating a high-frequency electromagnetic oscillation, comprising:

an amplifier configuration with two inputs and two outputs,

an oscillator crystal connected to the outputs of the amplifier configuration,

a bandpass filter configuration with two inputs and two outputs, which is connected, with two inputs, to the oscillator crystal and the two outputs of the amplifier configuration connected to the oscillator crystal, and back coupled, with two outputs, to the inputs of the amplifier configuration,

wherein, through dimensioning of the amplitude-frequency characteristic or the phase-frequency characteristic of the bandpass filter configuration as a function of the amplitude-frequency characteristic and the phase-frequency characteristic of the amplifier configuration and the oscillator crystal, the oscillation condition is fulfilled exclusively for a selected harmonic of the oscillator crystal, and the high-frequency, electromagnetic oscillation formed by this selected harmonic of the oscillator crystal is available at the output of the bandpass filter configuration.

2. An oscillator circuit as claimed in claim 1, wherein the amplifier configuration is designed with, in each case, at least one pair of at least substantially symmetrical inputs and outputs for processing electromagnetic oscillations, operated at least substantially symmetrically relative to a first reference potential.

3. An oscillator circuit as claimed in claim 2, wherein the amplifier configuration comprises a differential amplifier circuit, which is equipped with two field effect transistors coupled at their source terminals, the gate terminals of which are each coupled with one of the differential inputs of the amplifier configuration, wherein a drain terminal of each field effect transistor forms one of the differential outputs of the amplifier configuration, each of which is further coupled, via a load path, which comprises at least one field effect transistor, designated an output load transistor, with a terminal carrying a second reference potential.

4. An oscillator circuit as claimed in claim 3, wherein the amplifier configuration comprises a control-voltage generation stage for generating a control voltage, which is supplied to gate terminals of the output load transistors.

5. An oscillator circuit as claimed in claim 4, wherein the control-voltage generation stage comprises a series circuit comprising a constant current source and a field effect transistor bridged between its drain terminal and gate terminal.

7. An oscillator circuit as claimed in claim 3, wherein the amplifier configuration comprises an offset compensation device comprising, in each case, a high-pass circuit between:

each of the differential inputs of the amplifier configuration,

the gate terminal of the field effect transistor of the differential amplifier circuit comprising the amplifier configuration that is coupled with this differential input,

the differential output formed by the drain terminal of said field effect transistor,

wherein the limiting frequency is small as compared with the frequency operating range of the oscillator circuit.

8. An oscillator circuit as claimed in claim 7, wherein each of the high-pass circuits contains a capacitor, via which the differential input of the amplifier configuration is coupled with the gate terminal of the field effect transistor of the differential amplifier circuit comprising the amplifier configuration, and each of the high-pass circuits further contains an ohmic resistance element, via which the gate terminal of the field effect transistor of the differential amplifier circuit comprising the amplifier configuration is coupled with the differential output of the amplifier configuration formed by the drain terminal of the field effect transistor.

9. An oscillator circuit as claimed in claim 3, wherein the amplifier configuration is coupled with an auxiliary starting circuit, by means of which, during a predetermined period when the oscillator circuit is put into operation, a differential voltage is supplied to the gate terminals of the field effect transistors, coupled at their source terminals, of the differential amplifier circuit comprising the amplifier configuration.

11. (Currently amended) An oscillator circuit as claimed in claim 2, wherein the oscillator crystal takes the form of a two-terminal network and is connected with, in each case, one of its terminals to, in each case, one of the outputs of a pair of differential outputs of the amplifier configuration, in order to supply an electromagnetic oscillation

emitted by the amplifier configuration in the form of a differential signal

13. An oscillator circuit as claimed in claim 1, wherein the bandpass filter configuration is connected, with at least one pair of its differential inputs, to at least the pair of differential outputs of the amplifier configuration that are connected to the terminals of the oscillator crystal, and, with at least one pair of its differential outputs, to at least one pair of differential inputs of the amplifier configuration.

14. An oscillator circuit as claimed in claim 13, wherein the bandpass filter configuration is designed with a cascade connection of at least two bandpass stages.

19. (Currently amended) An oscillator circuit as claimed in claim 1, comprising a converter circuit, coupled with at least one pair of differential outputs of the bandpass filter configuration, for converting the differential signal emitted by these differential outputs into an electromagnetic oscillation operated asymmetrically relative to a reference potential.

X. APPENDIX: RELATED PROCEEDINGS

NONE

XI. APPENDIX: EVIDENCE

NONE